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USING A GLOBAL TEAM TO IMPROVE INTERNATIONAL AVIATION SAFETY OVERSIGHT

ABSTRACT

This paper describes the efforts made by both the FAA and ICAO to improve safety oversight by developing guidance in the form of regulations and manuals. After ICAO and the FAA became aware of their common goals, it was then apparent that both organizations would be more likely to succeed by working together. An ICAO and FAA global team was formed. The team consists of ICAO and FAA airworthiness safety inspector subject matter experts, operations safety inspector subject matter experts, training experts and a graphics design expert. The team decided that for guidance to be effective, it would have to be accompanied with training.

This paper outlines how the safety oversight guidance was constructed. Details are presented on how the global team is developing training in the use of the guidance. The methodology used in developing the training is discussed. The safety oversight topics covered in the training and the instructional strategies used are presented. The paper also describes the development of courseware that teaches individuals how to present the safety oversight training.

INTRODUCTION

Improving safety oversight has become a major focus for both the International Civil Aviation Organization (ICAO) and the U.S. Federal Aviation Administration (FAA). Findings of both ICAO and the FAA's International Aviation Safety Assessment (IASA) Program[1] have revealed that many states do not have regulations in place to provide guidance in standardizing inspections. Without regulations defining standards, compliance can not be identified let alone enforced. To improve safety oversight, the FAA has been developing Model Civil Aviation Regulations which states could use as a basis for developing their own regulations based upon their individual needs. The development of the model regulations has been a meticulous and time-consuming effort. The Model Regulations[2] are cross-

referenced to ICAO Regulations, the Federal Aviation Regulations (FARs) and the Joint Aviation Regulations (JARs). It is envisioned that states that do not have the infrastructure to support the FAR's or JAR's exclusively could use a more feasible vehicle, such as the model regulations, to develop their own civil aviation regulations. ICAO has been working on improving safety oversight with the development of safety oversight related guidance material designed to facilitate the implementation of international standards and practices throughout the world. These efforts focus on a series of manuals known generically as The Safety Oversight Manual (Document 9734)[3]. Like the Model Regulations, the development of the Safety Oversight Manual also has been a meticulous and time-consuming process. Both organizations realized that any safety oversight guidance given to states, either through regulations or manuals, must be accompanied with training to give states the total support they would need in understanding and applying certification guidance.

After both ICAO and FAA became aware of the common goal of improving safety oversight by providing guidance and training, it became apparent that both organizations would be more likely to succeed by working together. Thus, the ICAO and FAA team was formed. This global team consists of ICAO and FAA airworthiness safety inspector subject matter experts, operations safety inspector subject matter experts, training experts and a graphics design expert.

ANALYSIS OF THE TRAINING REQUIRED

It was decided that the safety oversight training would be developed and initially conducted at the FAA Academy using ICAO's TRAINAIR training methodology. The FAA members of the team were comfortable with this decision as TRAINAIR[4] uses the Instructional Systems Design (ISD) approach to training development, as does the FAA[5]. Therefore each organization's approach is very similar. A simplified version of the ISD approach, without feedback loops, is depicted in Figure 1.

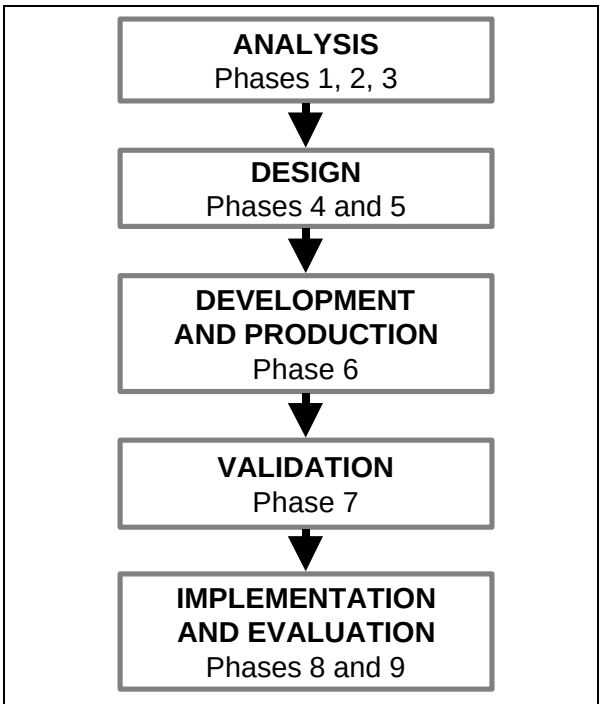

Figure 1 - Depicts the Instructional Systems Design Process

Using this approach, the team conducted a training needs assessment (or preliminary study, Phase 1) which revealed that guidance and training were needed most in the area of Air Operator Certification (AOC). Training would be needed for both the airworthiness safety inspector and the operations safety inspector specialties and therefore two courses should be designed and developed. Further analysis found that if airworthiness safety inspector training in Approved Maintenance Organization (AMO) certification was presented first during the airworthiness inspector training, it would facilitate a basic understanding of the certification process for air operators.

The next phase (Phase 2) in the analysis stage of the ISD approach to training development is to conduct a job and task analysis or instructional content analysis on which the training will be based. Job and task analyses for both the airworthiness and operations safety inspector specialties were conducted. Both ICAO and FAA felt that by having a global team conduct the job and task analyses, such as the one formed, it would help ensure that the training was international in nature as opposed to reflecting any one state's certification philosophy. A great deal of time was invested in this phase of training development as global teams present their own challenges[6]. In analyzing each task, consensus by all team members had to be reached. The team thoroughly analyzed every inspector task involved in air operator certification for each specialty. Key points during the certification process, where coordination between specialties is critical, were identified and stressed. Subject matter experts from both specialties intently collaborated on the inspectors' common tasks. It is anticipated that these efforts will be reflected in the courses to reinforce the need for both specialties to work together as a team during the certification process. Every task was referenced to and validated against ICAO regulations, guidance derived from the draft ICAO Safety Oversight Manual, and the Model Regulations. If it was found appropriate or helpful in defining standards of performance for a particular task, tasks were referenced to the FAR's or the JAR's. The airworthiness subject matter experts and training experts further analyzed every airworthiness inspector task involved in AMO certification. While work on the job and task analyses was being finalized, an analysis of the target population (Phase 3) that would need to be trained was conducted.

DESIGN AND DEVELOPMENT OF THE TRAINING

After the completion of the job/task and population analyses, phases four through six, which is the design and development of the curriculum, was begun. The basic structure for the two inspector courses have been designed and are now undergoing development, one airworthiness inspector course covering both AMO and AOC certification and one operations inspector course covering AOC certification. The team felt strongly that the "process of

certification" (See Figure 2) should be stressed in the instruction above any particular regulation.

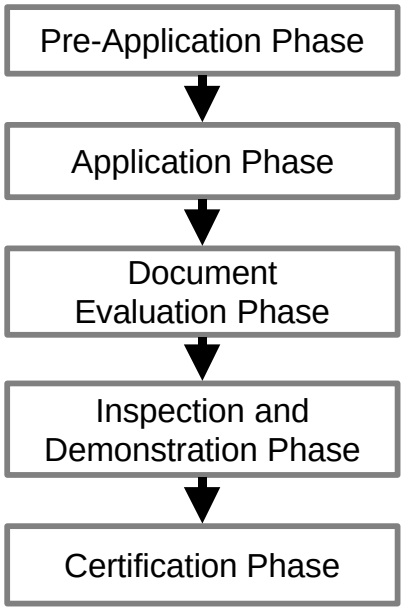

Figure 2 - Depicts the Process of Certification

If graduates of these courses had a "big picture" view of the process, they would more thoroughly understand it, and they would be more likely to understand how to develop or adapt regulations in their own states. After covering the process itself, instruction will be presented on regulations as they relate to the process. The operations inspector's course will overview the airworthiness inspector's roles and responsibilities in certification as will the airworthiness inspector's course overview the roles and responsibilities of the operations inspector during a certification. In this way, an inspector from one specialty will see the certification process from the perspective of the other specialty. This effort should further the concept of the two specialties working as a team.

Following the TRAINAIR training methodology, the courses are being divided into modules, each of which will begin with a lecture and end with a mastery test to evaluate if students have mastered the information presented in the lecture. Some modules will include individual or group student activities. The modules will be very visually oriented through the use of still and animated graphics. This should be helpful if students are taking these courses in a second language. Additionally, the visual nature of the modules will be enhanced because students will receive student handouts which contain 80% of the material presented during the lecture including graphics, minus instructor notes and answers to test questions. The lectures will cover both the general and specific guidance given in the regulations. The lectures will also include demonstrations on how states can develop more technical guidance, such as directives, to aid in the certification process. The mastery tests will require students to apply the information learned during the lectures by following a "mock" applicant, seeking air operator certification, throughout the course. Students (both operations and airworthiness) will evaluate the mock applicant during each phase of the certification process against the guidance given in the model regulations, the Safety Oversight Manual and excerpts from model directive material. Students will actually perform a simulated air operator certification. Additionally,

airworthiness inspector students will evaluate a “mock” AMO throughout an AMO certification.

For states wishing to teach the certification courses, two “train-the-trainer” courses are being developed one for each certification course. Each train-the-trainer course will teach basic instructor techniques from presenting information effectively to providing constructive student feedback. Instruction will be given on how to use the certification courses’ instructor handbooks. The train-the-trainer courses will provide students with practice in presenting actual modules from the certification courses in a classroom setting. The train-the-trainer courses will also contain guidance on inspector tasks from the certification courses where on-the-job training is recommended.

VALIDATION, IMPLEMENTATION, AND EVALUATION OF THE TRAINING

Following the ISD model, the courses will be evaluated for validation purposes (Phase 7) once their development has been completed. After validation, the courses will be implemented (Phase 8). After implementation, the courses will be further evaluated to determine their effectiveness (Phase 9). The operations course and the operations train-the-trainer course will be conducted this January at the FAA Academy. The airworthiness course and the airworthiness train-the-trainer course will be conducted next summer at the FAA Academy.

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